(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 508 580 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **92301708.1**

(51) Int. Cl.^{5} : **E05B 65/20**

(22) Date of filing : **28.02.92**

(30) Priority : **02.03.91 GB 9104447**

(43) Date of publication of application :
14.10.92 Bulletin 92/42

(84) Designated Contracting States :
DE FR GB

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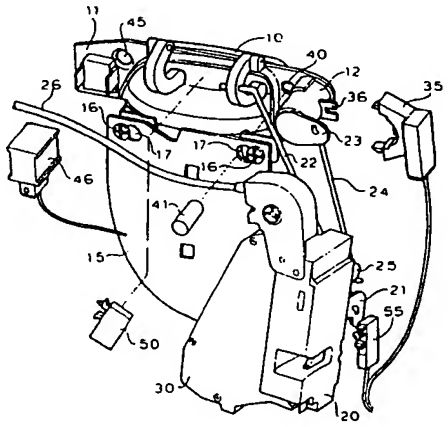
(54) Latch module for vehicle door.

(57) A latch module for a vehicle door has a door latch mechanism (20), an exterior door handle assembly (10,11) and cylinder lock (12) preassembled in appropriate relationship on a support plate (15), the latch mechanism (20) and/or handle assembly (10) being mounted on the support plate (15) in a manner which will permit relative movement therebetween to accommodate tolerance variations when locating the latch mechanism (20), exterior door handle assembly (10,11) and lock cylinder (12) with respect to the door.



EP 0 508 580 A1

The present invention relates to a latch module for a vehicle door.

US-A-4,052,094 discloses an integral exterior door handle/latch assembly for a vehicle door. This assembly however requires that the door handle is fitted at the edge of the door panel. EP-A-0,400,505 discloses an exterior door handle/latch mechanism preassembly in which the door handle and latch mechanism are preassembled on an "L" shaped bracket. The use of an "L" shaped bracket in this manner allows the door handle to be spaced away from the edge of the door.

In both of the known assemblies, the door handle is located rigidly with respect to the latch mechanism. As a consequence the position of the aperture in the door panel for the door handle and the position of the aperture in the side panel of the door for the latch mechanism, must be controlled to very close tolerances.

The present invention provides an improved latch module in which the exterior door handle and latch mechanism are preassembled.

According to one aspect of the present invention a latch module for a vehicle door comprises a door latch mechanism, an exterior door handle assembly and a cylinder lock preassembled in appropriate relationship on a support plate, characterised in that the latch mechamism and/or handle assembly are mounted on the support plate in a manner which will permit relative movement therebetween to accommodate tolerance variations when locating the latch mechanism, exterior door handle assembly and cylinder lock with respect to the door.

With this arrangement, the door latch mechanism, the exterior door handle assembly and the cylinder lock may be pre-assembled with mechanical linkages between the latch mechanism and the door handle and cylinder lock and the system may be tested before being fitted to a vehicle. The relative movement permitted between the latch mechanism and handle assembly will accommodate tolerance variations in doors built to normal standards.

According to a preferred embodiment of the invention, ancillary electrical equipment, for example, central locking motor, double locking motor, alarm switch, illumination entry switch, infra red sensor for remote control, door ajar indicator switch and key cylinder illumination bulb assembly may be pre-assembled with the door latch mechanism, exterior door handle assembly and cylinder lock, on the support plate, the associated wiring harness being carried by the support plate. In this manner, the associated electrical circuits may also be pre-tested before the module is fitted to the vehicle.

Preferably the interior door handle is connected to the door latch mechanism in known manner by means of a single flexible cable.

The invention is now described, by way of example only, with reference to the accompanying drawing which illustrates in perspective a latch module for a vehicle door, in accordance with the present invention.

The latch module illustrated comprises an exterior door handle 10 which is pivotally mounted on a handle housing 11, the handle housing 11 being adapted to be secured to the vehicle door in suitable manner. The handle housing 11 also includes a lock cylinder housing 12. The lock cylinder (not shown) is a snap fit within lock cylinder housing 12, so that a lock cylinder with appropriate combination may be fitted on line for a particular vehicle.

A flexible plastic plate 15 is attached to the handle housing 11 by a pair of rubber plugs 16 which engage in keyhole apertures 17 in the plate 15 and the housing 11. A latch mechanism 20 is secured to the plate 15 in suitable manner, such that when the handle housing 11 is secured to the door in its appropriate location, the latch mechanism 20 will be located in its appropriate location and may be secured to the edge of the door remote from the hinge.

The flexibility of the plate 15 will accommodate any tolerance variations in the lateral positioning of the latch mechanism 20, while the resilience of the rubber plugs 16 will accommodate tolerance variations in the spacing and orientation of the locations of the door to which the handle housing 11 and latch mechanism 20 are secured.

The door handle 10 is connected to a latch release lever 21 on the latch mechanism 20, by means of a rod 22, the rod 22 being secured at one end to the handle 10 and at the other end to the lever 21 in conventional manner, for example by means of suitable clips (not shown).

The lock cylinder housing 12 has a lever 23 which is engaged by the lock cylinder when inserted in the housing 12 and moves when the lock cylinder is rotated by means of a key. The lever 23 is connected by rod 24 to a locking lever 25 of the latch mechanism 20. The rod 24 may again be secured to the lever 23 and to the locking lever 25 by suitable clip means.

An interior door handle (not shown) is connected, in known manner, to the latch mechanism 20 via push/pull cable 26, so that the interior door handle may actuate the latch release lever 21.

A central locking motor/double locking motor 30 is formed integrally of the latch mechanism 20, for electronic locking or unlocking of the latch mechanism. A door lock control switch 35 clips onto the lock cylinder housing 12 and is located radially thereof by projection 36. A cam formation on lever 23 which will rotate with lever 23 as the lock cylinder is turned by means of a key, engages follower means on the door lock control switch 35 to control the switch 35.

An aperture 40 is provided in the handle housing 11 adjacent lock cylinder housing 12, a bulb assembly 41 being located with respect to the handle housing

11 adjacent aperture 40 to provide illumination for the door lock. A second aperture 45 is provided through the handle housing 11 on the side of the handle 10 remote from lock cylinder housing 12. An infra-red receiver 46 is clipped to the handle housing 11 adjacent aperture 45 for remote infra-red door locking and alarm setting. Switch means 50 may also be located with respect to the handle housing 11 to sense movement of the door handle 10 to control the courtesy lights of the vehicle. Switch 55 is assocated with the latch mechanism 20, to provide an indication when the door is ajar.

The wiring to the motor 30, switches 35, 50 and 55, infra-red receiver 46, and a bulb assembly 41 may be secured to plate 15, for example by means of clips, suitable connection means being provided on the plate 15 by which the various circuits may be connected to the main loom of the vehicle.

The module described above provides a self contained subassembly which may be assembled and tested prior to fitting to the vehicle. When fitted to the vehicle, the handle assembly 11 and latch mechanism 20 are secured to the vehicle door in their appropriate locations, and the interior door handle (not shown) may be secured with respect to the interior door trim panel prior to it being fitted. An external trim bezel will then be fitted around the door handle 10 and secured internally of the door by suitable means.

It should be noted that the various electronic components included in the latch module, are given by way of example only and any combination of these components and/or additional components may be used. Where various components are not used, the components of the module may be adapted accordingly or a component of common design, for example the handle housing 11 may be used, the exterior trim bezel being adapted, for example to blank the aperture 45 if an infra-red receiver is not to be incorporated.

While in the above embodiment the exterior door handle assembly (10,11) is mounted to the support plate (15) in a manner which will permit relative movement of the handle assembly (10,11) with respect to the support plate (15), it will be appreciated that the latch mechanism (20) may alternatively or additionally be mounted with respect to the support plate (15) in similar manner. Alternatively the flexibility of the support plate (15) may be sufficient to accommodate tolerance variations in the door build.

Claims

1. A latch module for a vehicle door comprising a door latch mechanism (20), an exterior door handle assembly (10,11) and a cylinder lock (12) preassembled in appropriate relationship on a support plate (15), characterised in that the latch mechanism (20) and/or handle assembly (10,11) are mounted on the support plate (15) in a manner which will permit relative movement therebetween to accommodate tolerance variations when locating the latch mechanism,(20), exterior door handle assembly (10,11) and cylinder lock (12) with respect to the door.

2. A latch module according to Claim 1 characterised in that the support plate (15) is flexible.

3. A latch module according to Claim 1 or 2 characterised in that the handle assembly (10,11) comprises a handle housing (11) to which a handle (10) is pivotally attached, said handle housing (11) being adapted to be secured to the vehicle door, the support plate (15) being attached to the handle housing (11) by flexible connecting means (16,17).

4. A latch module according to Claim 3 characterised in that the support plate (15) is secured to the handle housing (11) by means of rubber plugs (16).

5. A latch module according to Claim 4 characterised in that the rubber plugs (16) engage in keyhole apertures (17) in the handle housing (11) and/or in the support plate (15) to connect the handle housing (11) to the support plate (15).

6. A latch module according to any one of Claims 3 to 5 characterised in that the lock cylinder (12) is located with respect to the handle housing (11).

7. A latch module according to any one of the preceding claims characterised in that the latch assembly (20) is connected to an interior door handle by means of a flexible cable (26).

8. A latch module according to any one of the preceding claims characterised in that ancillary electrical equipment associated with the door latch assembly (20), the exterior door handle assembly (10,11) or the cylinder lock (12) is preassembled with the door latch mechanism (20), exterior door handle assembly (10,11) and cylinder lock (12) on the support plate (15).

9. A latch module according to Claim 8 characterised in that a central locking motor (30), a double locking motor (30), an illumination entry switch (50), an infra-red sensor for remote control (46), a door ajar indicator switch (55), a key cylinder illumination bulb assembly (41) or any combination thereof, are preassembled with the latch mechanism (20), exterior door handle assembly (10,11) and cylinder lock (12) on the support plate (15).

10. A latch module according to Claim 8 or 9 characterised in that wiring from the ancillary electrical equipment is secured to the support plate (15).

11. A latch module according to any one of Claims 8 to 10 characterised in that connection means is provided on the support plate (15) for connection of the ancillary electrical equipment to the vehicle wiring loom.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number EP 92301708.1

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,A	US - A - 4 052 094 (GUSTAF WIDEN) * Claims 1-5; fig. 1-6 * --	1-9	E 05 B 65/20
D,A	EP - A - 0 400 505 (FIAT AUTO S.p.A.) * Claims 1-6; fig. 1-6 * --	1-6,9	
A	DE - A - 3 839 464 (ROLF LEISTNER) * Claims 1-6; fig. 1-4 * --	1-6	
A	DE - A - 3 313 100 (ROLF KRÜGENER) * Claims 1-7; fig. 1-2 * --	1-6	
A	EP - A - 0 398 107 (HELLA KG HUECK & CO) * Claims 1-5; fig. 1-6 * ----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 05 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	04-08-1992	CZASTKA

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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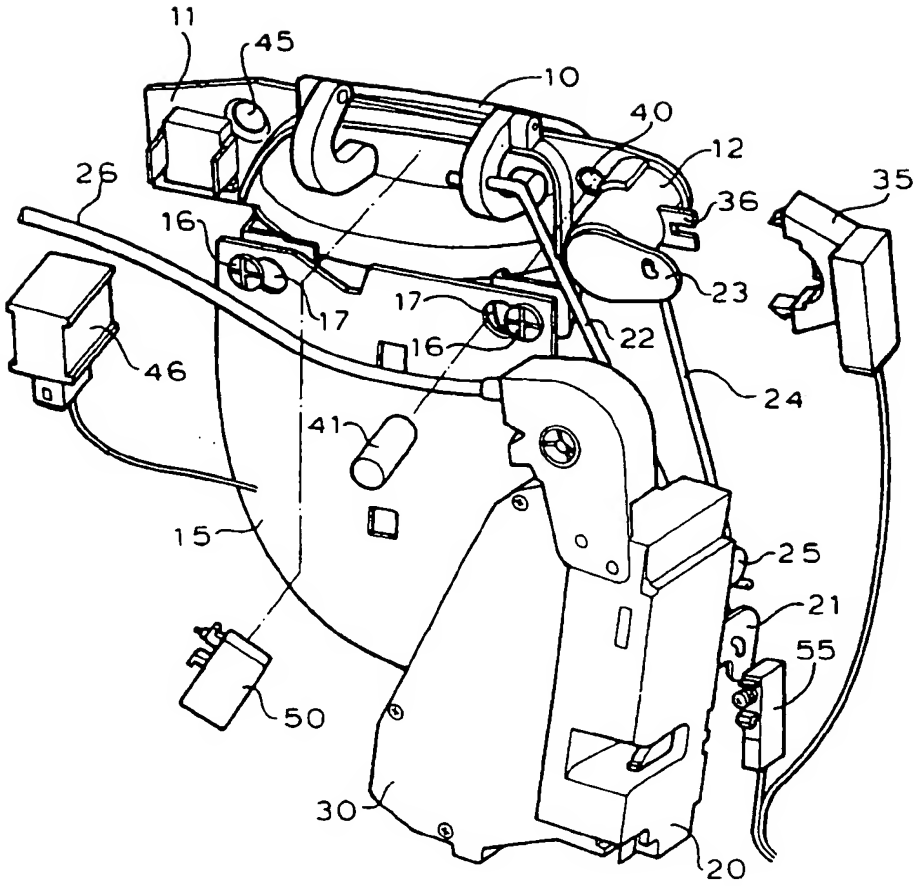

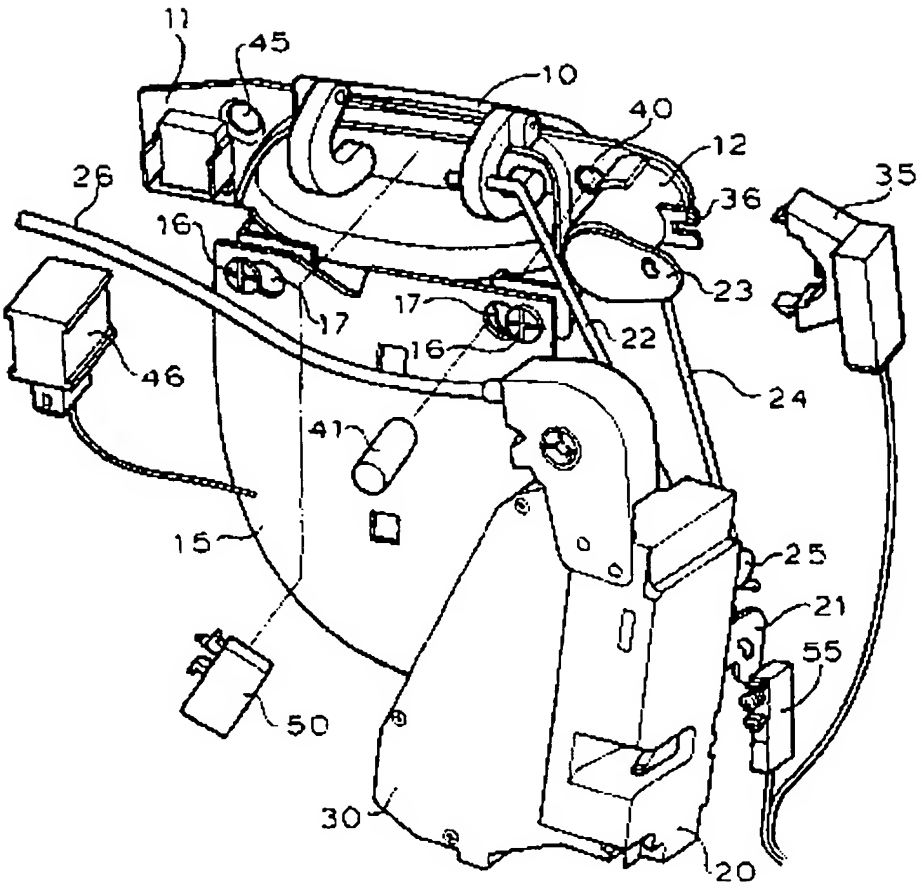
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